# Pesticide Review

News About Pesticides & Regulations

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## Agricultural Health Study Update



The Agricultural Health Study is a long-term analysis of the health of U.S. farmers. It is conducted primarily by the National Cancer Institute, National Institute of Environmental Health Sciences, U.S. Environmental Protection Agency, University of Iowa, Battelle, and the National Institute for Occupational Safety and Health. The study was started in 1997 with 53,371 farmers (plus 32,347 spouses) located in Iowa and North Carolina. A large number of the subjects' children were also included in this study.

Generally, health and disease studies work backward from illness. That is, a group of people showing a level of illness are questioned about their past activities, such as the use of particular pesticides, other chemicals, wearing of protective equipment, and other lifestyles. Reliance on memory of what occurred over the previous decades, or even more recently, has obvious pitfalls—particularly when the amount of use of certain materials is questioned. Commonly, the subject of the study is deceased, forcing investigators to rely on the memories of spouses, relatives, or others.

The Agricultural Health Study is different in that periodic interviews are made of current and very recent past activities. There are also on-site visits, where activities are observed by study personnel to verify reported activities, such as use of personal protective equipment, presence of children in and around pesticide mixing and other farm activities, and other general safety procedures. Illnesses and injuries of the study subjects are then followed through the years as they occur, rather than after the fact. The intention is that the study will continue for several decades, providing a very high-quality picture of farm-related illnesses and health benefits.

Some characteristics of the study are as follows. Concerning race, 97% of the farmers are white, as are 98% of their spouses. Ninety-seven percent of the farmers are men, with 99% of the spouses being women. Agewise, 43% of the farmers are 50 or over, with 42% of the spouses being at least 50 years old. Eighty-two percent of the farmers have at least high school educations, along with 89% of their spouses. Only 43% of the farmers have ever smoked, with 15% being current smokers. Even fewer of their spouses smoke, with 26% having ever smoked and 10% being current smokers. Ninety-four percent of the farmers have applied pesticides, compared to 54% of their spouses.

Enough time has passed since the beginning of the study to see some health trends emerging. These trends pertain not only to farmers but also to others handling agrichemicals and performing agricultural types of tasks.

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Generally, the data so far do not show any strong correlation with cancer in those using pesticides (Table 1). A Standard Incidence Ratio (SIR) of 1.0 indicates that the occurrence is the same as for the general human population. An SIR below 1 means that there is a lower rate of occurrence than for the general population, whereas an SIR above 1 indicates a higher rate of occurrence. An SIR of 0.8 indicates that farmers have a slightly lower likelihood of cancer than the general population. This is probably primarily due to the low incidence of smoking, compared to the general population, borne out by the much lower incidence of respiratory system cancers such as lung cancer. The much higher incidence of ovary cancers (SIR: 4.1) is likely to be due to the small number (3%) of the private applicators' (farmers') being women. With only about 1,600 women involved, a very small number of cases can greatly increase the SIR.

Only prostate cancer appears to be more likely in private applicators than in the general population. These data are currently being studied more closely in an attempt to determine the reason for this increased rate. Although thyroid and other endocrine cancers, as well as multiple myeloma, are slightly above the general population cancer rate, a difference this small may not be significant. Subsequent data over the coming years should determine its significance.

Cancer incidence for spouses, shown in Table 2, also exhibits an overall lower rate, SIR: 0.8, than for the general population. Again, the low incidence of respiratory system cancers and associated low percent of smokers probably account for much of the lower cancer occurrence. In spouses, for which the percent of women is much higher (99%), ovary cancer incidence is below the general population, with an SIR of 0.7. Prostate cancer continues to be above the general population occurrence even though the number of males, fewer than 350, is very low. Again, with this small number of males, this prostate SIR may not be an important

**Table 1. Malignant cancer incidence follow-up (1994–1999) for private applicators.**

| Cancer site | Number | SIR* |
|---|---|---|
| All sites | 1,686 | 0.8 |
| Buccal cavity | 45 | 0.6 |
| Digestive system | 300 | 0.8 |
| Respiratory system | 193 | 0.4 |
| Skin melanomas | 62 | 0.8 |
| Female breast | 15 | 0.8 |
| Ovary | 8 | 4.1 |
| Prostate | 672 | 1.2 |
| Urinary system | 116 | 0.6 |
| Brain and central nervous system | 23 | 0.8 |
| Thyroid and other endocrine | 19 | 1.1 |
| Non-Hodgkin's lymphoma | 70 | 0.9 |
| Multiple myeloma | 8 | 1.1 |
| Leukemia | 45 | 0.8 |

*SIR: Standard Incidence Ratio. Ratio of occurrence compared to the general populations of Iowa and North Carolina.

**Table 2: Malignant cancer incidence follow-up (1994–1999) for spouses of private applicators.**

| Cancer site | Number | SIR* |
|---|---|---|
| All sites | 645 | 0.8 |
| Buccal cavity | 12 | 0.9 |
| Digestive system | 102 | 0.8 |
| Respiratory system | 39 | 0.3 |
| Skin melanomas | 42 | 1.5 |
| Female breast | 318 | 1.0 |
| Ovary | 26 | 0.7 |
| Prostate | 4 | 1.3 |
| Urinary system | 29 | 0.8 |
| Brain and central nervous system | 12 | 1.1 |
| Thyroid and other endocrine | 18 | 0.9 |
| Non-Hodgkin's lymphoma | 28 | 0.9 |
| Multiple myeloma | 8 | 1.1 |
| Leukemia | 14 | 0.9 |

*SIR: Standard Incidence Ratio. Ratio of occurrence compared to the general populations of Iowa and North Carolina.

**Table 3: Mortality follow-up (1994–2000) for private applicators.**

| Cancer site | Number | SMR* |
|---|---|---|
| All causes | 1,558 | 0.5 |
| All cancer | 514 | 0.6 |
| Digestive system | 145 | 0.7 |
| Colon | 56 | 0.7 |
| Pancreas | 29 | 0.6 |
| Lung | 48 | 0.7 |
| Non-Hodgkin's lymphoma | 33 | 0.9 |
| Leukemia | 28 | 0.8 |
| Diabetes | 26 | 0.3 |
| Cardiovascular disease | 537 | 0.5 |
| Cardiac obstruction pulmonary disease | 35 | 0.2 |
| Motor vehicle accidents | 56 | 0.8 |
| Non-motor vehicle | 74 | 1.0 |
| Suicide | 46 | 0.6 |

*SMR: Standardized Mortality Ratio. Ratio of mortality compared to that of the general population of Iowa and North Carolina.

**Table 4: Mortality follow-up (1994–2000) for spouses of private applicators.**

| Cancer site | Number | SMR* |
|---|---|---|
| All causes | 497 | 0.6 |
| All cancer | 239 | 0.7 |
| Digestive system | 56 | 0.9 |
| Colon | 31 | 1.2 |
| Pancreas | 10 | 0.7 |
| Lung | 29 | 0.3 |
| Breast | 54 | 0.9 |
| Non-Hodgkin's lymphoma | 16 | 1.2 |
| Leukemia | 14 | 1.4 |
| Diabetes | 18 | 0.6 |
| Cardiovascular disease | 82 | 0.4 |
| Cardiac obstruction pulmonary disease | 15 | 0.3 |
| Motor vehicle accidents | 14 | 0.8 |
| Non-motor vehicle | 8 | 0.6 |
| Suicide | 7 | 0.7 |

*SMR: Standardized Mortality Ratio. Ratio of mortality compared to that of the general population of Iowa and North Carolina.

**Table 5: Malignant cancer incidence follow-up (1975–1998) for children in Iowa.**

| Cancer site | Number | SIR* |
|---|---|---|
| All sites | 50 | 1.4 |
| Leukemia | 9 | 0.9 |
| Lymphoma | 9 | 2.2 |
| Hodgkin disease | 5 | 2.6 |
| Non-Hodgkin's lymphoma | 2 | 1.2 |
| Burkitt's | 2 | 2.7 |
| Brain tumors | 11 | 1.6 |
| Bone tumors | 4 | 2.2 |
| Germ cell tumors | 5 | 2.3 |

*SIR: Standard Incidence Ratio. Ratio of occurrence compared to the general population of Iowa.

statistic. The only major increased SIR over the general population is that of skin melanomas, which is likely to be due to increased sun exposure.

Overall private applicator mortality is addressed in Table 3. As is generally thought, farming appears to be a relatively healthy occupation, with an SMR of 0.5 for all causes of death being well below that of the general human population. The SMR, Standardized Mortality Ratio, is the ratio of mortality compared to the general human population. Private applicators' spouses are also less likely to die early than the general population, with an SMR of 0.6. Spouses are more likely than the general population to die from colon cancer, non-Hodgkin's lymphoma, and leukemia. They are less likely to die at these ages from all other forms of cancer or other causes.

The children of private applicators showed an increased incidence of cancer, SIR: 1.4, compared to the general population. Of the types of cancer reported, only leukemia incidence was below that of the general population. These data are also being studied in more detail. The odds ratio of children having cancer and whose parents did not wear chemical-resistant gloves was 2, compared to an odds ratio of 1 for children whose parents did wear chemical-resistant gloves. An odds ratio of 1 implies that the event was equally likely in both groups. An odds ration greater than 1 implies that the event is more likely in the first group. An odds ration of less than 1 implies that the event is less likely in the first group.

As data continue to be gathered in the Agricultural Health Study, and reports as well as scientific papers are written, we will update you on the results. *(Phil Nixon)*

# Knowing Where You Are Going and Where You Have Been

GPS and GIS technology is available for many types of pesticide applications. The main goal behind the purchase of this technology should be to improve application accuracy and efficiency. It can also provide detailed records of those applications. A basic understanding of this technology can help guide decisions on whether to implement it in your operations.

*GPS* stands for global positioning system. GPS is a network of satellites that are used to determine a position and assist with navigation. The satellites send out radio signals, which are monitored with a GPS receiver and antenna. The receiver determines where it is located by calculating its distance from each satellite. It calculates this distance by determining how long it takes the radio signal to travel from the satellite to the receiver. It uses these distances to triangulate its position. The accuracy of the receiver is important and is listed as a specific distance. A receiver with meter accuracy, for example, means the receiver can accurately calculate its position to within 1 meter of the true position 95 percent of the time. Submeter accuracy means the receiver is less than 1 meter off in determining where it really is 95 percent of the time.

Many sources of error are involved with receiving the satellite signals and calculating the position. Differential correction helps improve the accuracy of GPS receivers, and receivers with this capability are often referred to as DGPS receivers. It works by having a fixed receiver with a known location monitor the signals from the satellites. It then calculates the difference between the data received from the satellites and its actual position, and transmits that difference to other receivers via a radio signal. The other receivers then use the differential correction with the signals they are receiving from the satellites, improving their accuracy.

There are different types of differential correction. *WAAS* stands for wide area augmentation system and is operated by the Federal Aviation Administration (FAA). WAAS is free but is not as accurate as other types of DGPS. The U.S. Coast Guard operates a beacon in certain areas that provides a differential correction signal. Differential services such as Omnistar are available via a paid subscription and provide differential correction through a communications satellite system. These types of differential correction are more accurate, but availability is more limited. It is important to determine what types of differential correction are available in your area and to choose a GPS receiver that can receive these differential signals.

A Real-Time Kinematic (RTK) system can provide centimeter-level accuracy through the use of a special base station that the user places near where the GPS receiver is being used. This base station transmits a differential signal to the receiver and provides greater accuracy than with other DGPS receivers. RTK equipment is more expensive than other GPS equipment and is not necessary for typical GPS uses.

The interface between the GPS receiver and the applicator is also important. It allows the applicator to interpret where he or she is and guides the application, ensuring that the sprayer stays on the correct path. Many systems are driver assisted, using a lightbar to indicate the vehicle's location in relation to the center of the swath. This feature allows the driver to steer in the correct direction to remain on the right path. Some units use an image instead of a lightbar. The image depicts the vehicle and the center line of the swath, allowing the driver to determine which direction to steer in. When choosing a GPS guidance system for a sprayer, make sure you pick an interface type that you are comfortable with and can easily interpret while driving.

GPS can be used to guide straight and curved swaths. The applicator drives the initial reference pass, which the GPS marks by denoting the beginning point (A) and the end point (B) of the pass. The center lines for the remaining passes are then calculated based on the swath width entered by the applicator. GPS can be used to guide for both back-and-forth and racetrack patterns. The system can warn the applicator when entering an area that has already had an application made. Most currently available DGPS receivers are accurate enough to track a swath with greater precision than many applicators can actually steer. Automatically steered vehicles are also available. They require the accuracy provided by RTK GPS.

*GIS* stands for geographic information system and is a computer-based collection of information that can be displayed visually in the form of maps. GIS can provide a spatial picture of a wide variety of information, including soil type, fertility, pest populations, field borders, location of obstacles, tile lines, areas sensitive to pesticides, buildings, riparian zones, required application rates, and many other types of information. This data can be combined, sorted, analyzed, and displayed using interactive maps. As an example, GIS can be used to create a map of required herbicide-application rates based on a site map of weed populations. The maps generated using this data can be displayed in the sprayer.

Data can be collected and stored in a GIS in a variety of ways. Digital aerial photographs can be added to provide a background reference for determining location and nearby landmarks. Soil type, pest populations, and field obstacles can be mapped by scouting with handheld GPS units. Remote sensing devices such as satellites can also be used to develop information layers for a GIS. Many types of information developed from remotely sensed data are available on the Web for downloading into a GIS database.

GIS is usually integrated with GPS, so the location of the sprayer in relation to the GIS-based maps can be determined. This integration allows the applicator to successfully maneuver around obstacles, locate targeted pests, and utilize other information stored in the GIS. When combined with a spray controller and other technology such as pulse-width modulation, the correct application rate required at a given location can be achieved automatically. GPS and GIS technology are key components of making variable-rate applications.

Another advantage of GIS and GPS technology is the ability to store detailed information about the application. This information is linked to the exact location of the sprayer during the application. Spray application rate, operating pressure, vehicle speed, and nozzle flow rate can all be recorded into the GIS as the sprayer travels across the application site. Other information, such as the pesticide applied and weather conditions, can also be stored in a GIS. This information can be valuable for record keeping and making additional treatment decisions.

GPS and GIS can improve accuracy and should be considered for use in many types of pesticide applications. *(Scott Bretthauer)*

# Trash or Treasure: What's in the 'Net?

I have to admit it, I love the Internet! Well, maybe not all of it. Certain Web sites and email spam, I could do without. The hook for me is the amount of information and the speed at which new information is posted and circulated. As an educator, I rely upon select Web sites and email messages to stay informed regarding pest management, pesticide safety, and pesticide regulatory issues.

In some ways, the beauty of the Internet is also the beast. Publishing has never been easier or cheaper. With a computer, a little skill, and a few dollars for server space, most anyone can publish his or her message to the world. However, with a little experience, most Internet users come to realize that all Web sites and email messages are not equally valuable or trustworthy. People publish online for many reasons, but most content can be categorized as having one or more of the following goals: (1) to inform or explain, (2) to persuade, (3) to market, or (4) to entertain.

In evaluating the usefulness of any information, whether online or otherwise, it is important to consider at least the following questions:

1. What is the three-letter suffix in the Web site URL or email address (com = commercial organization; edu = higher education, college or university; gov = government agency or organization; int = international organization; mil = military; net = network provider; org = nonprofit organization)?
2. Who is the author? What is his or her background and qualifications?
3. What is the writer's and the organization's mission or objective?
4. Is the information verifiable? (Does the author cite sources?)
5. Does the information make sense?

For a more detailed discussion of this topic, consider visiting the following Web sites:

1. Harris, Robert. "Evaluating Internet Research Sources." VirtualSalt. November 17, 1997. <http://www.virtualsalt.com/evalu8it.htm>. Accessed 6/22/04.
2. "Evaluating Internet Resources." St. Norbert College. <http://www.snc.edu/library/guides/evalnet.htm>. Accessed 6/22/04.
3. "Trash or Treasure? How to Evaluate Internet Resources." Baltimore County Public Library. October 16, 2002. <http://www.bcpl.net/~sullivan/modules/tips/eval.html>. Accessed 6/22/04.

Evaluating the usefulness and meaning of human health and environmental studies is often particularly troublesome. The following Web sites provide general but useful guidance on this subject:

1. Thompson, Kimberly M. "Health Insight: Taking Charge of Health Information." Harvard School of Public Health. <http://www.health-insight.harvard.edu>. Accessed 6/22/04.
2. "Evaluating Health Information on the Internet." Queensland Health. June 2002. <http://www.health.qld. gov.au/phs/Documents/cphun/19444.pdf>. Accessed 6/22/04.
3. Wartenberg, Daniel. "Epidemiology for Journalists." FACSNET. January 24, 2000. <http://www.facsnet.org/tools/ref_tutor/epidem>. Accessed 6/22/04.

Regardless of the topic, we are all too often bombarded by bits of evidence and premature conclusions. Well-designed and well-executed health and environmental studies take time. Accurate conclusions are drawn from the "weight of the evidence" from all studies rather than individual studies. It is good for those of us "on the outside" to be watchful but also careful that we don't draw premature and inaccurate conclusions.

**Give it a try. . .**

Out of curiosity, I checked to see how many Web sites mention the word "pesticides." On June 22, 2004, I used www.Google.com, which is ranked as the most popular search engine [1, 2, 3] to find out. I was surprised to find that there were 2,710,000 listings! Information from the first page of some of these Web sites is provided below, with the Web sites in the same order that Google served them up. Each of these Web sites has something in common—that is, protecting humans and the environment. From the brief summaries provided below (from Google), can you begin to evaluate the usefulness and motives of each Web site? When you have the time and Internet access, follow some of the links and evaluate the sites further. Enjoy!

**EPA: Pesticides.** EPA's Pesticide Program's mission is to protect public health and the environment from the risks posed by pesticides and to promote safer means of pest control. http:/www.epa.gov/pesticides

**Welcome to Beyond Pesticides.** Beyond Pesticides has the latest pesticide news, projects, pesticide fact sheets, and non-toxic alternatives. http://www.beyondpesticides.org

**PAN Pesticides Database.** Data on 6500 pesticides, insecticides and herbicides, including toxicity, water pollution, ecological toxicity, uses and regulatory status. http://www.pesticideinfo.org

**EXTOXNET—The EXtension TOXicology NETwork.** So. . . Are you looking for a source of objective, science-based information about pesticides—written for the non-expert? The EXTOXNET InfoBase may be for you . . . http://extoxnet.orst.edu

**Introduction to the New Pesticides Safety Directorate (PSD).** The Pesticides Safety Directorate (PSD) Website. Welcome to Our New Website. This is the new website of the Pesticides Safety Directorate (PSD). http://www.pesticides.gov.uk

**Pesticide Action Network North America (PANNA).** Explore our extensive resources, find out about our organization and work, and join us in reducing the use of hazardous pesticides. http://www.panna.org

**NCAP—Northwest Coalition for Alternatives to Pesticides.** PO Box 1393, Eugene OR 97440-1393 Ph. 541-344-5044 Fax 541-344-6923 info@pesticide.org. http://www.efn.org/~ncap

**MedlinePlus: Pesticides.** Search MEDLINE/PubMed for recent research articles on • Pesticides. . . . Choosing Pesticides Wisely (National Institute for Occupational Safety and Health). http:/www.nlm.nih.gov/medlineplus/pesticides.html

*(Bruce Paulsrud)*

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2. Sullivan, D. "Hitwise Search Engine Ratings." SearchEngineWatch [Online]. May 17, 2004. <http:// searchenginewatch.com/reports/article. php/3099931>. Accessed 6/22/04.
3. Sullivan, D. "Nielsen NetRatings Search Engine Ratings." SearchEngineWatch [Online]. February 23, 2004. <http:// searchenginewatch.com/reports/ article.php/2156451>. Accessed 6/22/04.


# Pesticide Update

The following information provides registration status of particular pesticides and should not be considered as pesticide recommendations by University of Illinois Extension.

## Agronomic

*DIMOXYSTROBIN—BASF*—A new fungicide being developed for use on cereals.

*LAREDO (myclobutanil)—Dow AgroSciences*—Being developed for use on stone fruits, pome fruits, nut crops, and grapes and as a cotton seed treatment. [fungicide]

*OSPREY 4.5% (mesosulfuron-methyl)—Bayer Crop Science*—The product is being introduced for use on wheat. It has a wide weed-control spectrum.

*SEQUENCE (s-metolachlor/glyphosate)—Syngenta*—A new combination herbicide being developed for use in peanuts, cotton, and soybeans. [herbicide]

## Fruit/Vegetable

*6-BA—Valent*—EPA exempted this biochemical growth regulator from residue-tolerance requirements when used on apples at below 182 grams a.i./acre and on pistachios when used at below 60 grams a.i./acre. *(FR,* vol. 69, 4-20-04)

*COURIER (buprofezin)—Nichimo America*—Added to their label the use on snapbeans and removed from their label the use on citrus. [insecticide]

*FLORAMITE (bifenazate)—Crompton/Uniroyal*—A new registration for use on greenhouse-grown tomato varieties that have fruit greater than 1 inch in diameter when mature. [insecticide]

*MAXCEL (N-6 benzyladenine)—Valent*—A new growth regulator to be used on apples and pistachios.

*VINTAGE SC (fenarimol)—Gowan*—A new formulation for use on grapes to control powdery mildew.

## Turf/Ornamental

*DRIVE (quinclorac)—BASF*—Added to their label the control of English daisy, Carolina geranium, morningglory, and wild violet in turf.

*MERIT (imidacloprid)—Bayer Environmental Sciences*—Added to their label the control of European craneflies in turf.

*MILSANA* (Rymontria sachelinensis)—*KHH Bio Science*—A new biological fungicide used to control gray mold and powdery mildew on ornamentals.

*PURE SPRAY 10E (horticultural oil)—Petro Chemical*—A new horticultural oil formulation available in the United States for use on ornamentals. [insecticide]

*STATURE DM (dimethomorph)—BASF*—A new formulation for use on greenhouse and nursery-grown ornamental plants. [fungicide]

## Many

*ANDANTE* (Muscodor albus *strain QST-20799)—Agra Quest*—Proposed to EPA to register this new active ingredient as a methyl bromide replacement to control soil fungi and nematodes. The comment period expired 5-14-04. *(FR,* vol. 69, 4-14-04)

*ARCHESQUE* (Muscodor albus *strain QST-20799)—Agra Quest*—Proposed to EPA to register this new active ingredient for the control of postharvest diseases in food and nonfood crops, and the preplant control of seed-, bulb-, and tuber-borne diseases of food and nonfood commodities. The comment period expired 5-14-04. *(FR,* vol. 69, 4-14-04)

*CITRONELL OIL—Natural Plant Protection*—EPA established an exemption from residue-tolerance requirements on all commodities when used to control mites. *(FR,* vol. 69, 4-28-04)

*FUJIMITE (fenpyroximate)—Nichimo America Inc*—A new 5% EC formulation being introduced to control mites and pear psylla on cotton, pome fruits, grapes, and ornamentals.

*GERANIOL—Natural Plant Protection*—EPA established an exemption from residue-tolerance requirements on all commodities when used to control mites. *(FR,* vol. 69, 4-28-04)

*HEADLINE (pyraclostrobin)—BASF*—Added to their label the use on pecans and triticale.

*MELOCON WG* (Paecilomyces lilacinus *strain 251)—Prophyta Biologischer Pflanzenschutz GmbH*—A new biological nematicide being developed to control plant parasitic nematodes in the soil.

*MESSENGER (harpin protein)—Eden Bio Science*—EPA established an exemption from residue-tolerance requirements on all food commodities when applied to enhance plant growth, quality, and yield; to improve plant health; and to aid in pest management. *(FR,* vol. 69, 5-5-04)

*METRAFENONE—BASF*—A new fungicide being developed for use on cereals and grapes.

*MITAC/OVASYN (amitraz)—Bayer Crop Science*—EPA received a request to voluntarily cancel registration for these two products. Unless withdrawn, the changes will take effect in 30 days with a 1-year period for the registrant to sell existing inventories. *(FR,* vol. 69, 3-17-04) [insecticide]

*OVERDRIVE (diflufenzopyr/dicamba)—BASF*—A new postemergence combination herbicide to control broadleaf weeds in roadside, industrial, and rangeland areas.

*PAYLOAD (flumioxazin)—Valent*—A new herbicide for use in noncrop areas for long-term weed control.

*PROAXIS (gamma-cyhalothrin)—Pytech Chemical*—Recently registered in the United States on a wide range of fruit, vegetable, and field crops. [insecticide]

*PROLEX (gamma-cyhalothrin)—Pytech Chemical*—Received U.S. registration for use on cotton, peanuts, rice, sorghum, soybeans, sugarcane, and noncrop areas. [insecticide]

## Other

*BAYER CROP SCIENCE*—The company has purchased Uniroyal/Crompton's 50% share in Gustafson, the seed-treatment company. Gustafson was a 50:50 company of Bayer and Uniroyal. The purchase price was $124 million.

*BECKER UNDERWOOD*—The company has acquired Bio Care Technology, which is Australia's leading biotech company. Bio Care produces legume inoculants, Bio Cane for sugarcane, Bio Green for turf and pastures, Nogall for canker control in fruit trees, and other bacterial and fungal agents.

*BIOTECH CROPS*—U.S. planted acreage this year is expected to be 46% on corn, 86% on soybeans, and 76% on cotton. This is in comparison to the total planted acreage.

*DOW AGROSCIENCES*—The com-pany has given exclusive rights to Gowan Co. to market its Lorsban 75WG (chlor-pyrifos) insecticide. It will replace Gowan's 50WG formulation.

*MAKHTESHIM AGAN*—The company has purchased FarmSaver.com for $44 million. FarmSaver.com is expected to have sales of $45 million this year.

*MONSANTO*—The company plans to introduce Roundup Ready alfalfa in the United States as early as 2005.

*NIPPON SODA*—This Japanese company has acquired Dainippon Ink & Chemicals agricultural business.

*SYNGENTA*—The company has a transgenic cotton called VIP-COT. Introduction is expected in 2005, and it will be resistant to lepidoptera pests.

*(Michelle Wiesbrook, unless otherwise noted, adapted from* Agricultural Chemical News, *May and June 2004.)*

# Free Recycling Program for Pesticide Containers

Pesticide applicators will have an opportunity to dis-pose of empty pesticide containers safely and conveniently this summer through the Illinois Department of Agriculture's award-winning pesticide-container recycling program.

Beginning in July, sites throughout Illinois will collect the containers for free and grind them into plastic chips that will be used to make shipping pallets, hazardous waste drums, and other useful products.

Nearly 1.8 million containers have been recycled since the program was first of-fered in 1990, an effort the Illinois Recycling Association honored recently when it named the program its Outstanding Statewide Recycling Program for 2004.

"Illinois farmers are among the most productive and efficient producers in the world because of the care they take to preserve soil and water resources, and this program is an excellent example of their stewardship," Agriculture Director Chuck Hartke said. "Without their concern for our environment, those containers probably would have been dumped in a landfill."

Metal and household pesticide containers are not eligible for the recycling program. Collection sites will accept only high-density polyethylene, #2 plastic, agrichemical containers that are clean and dry. Participants are responsible for rinsing them and removing all caps, labels, booklets and foil seals.

The program is a cooperative venture between the Illinois Department of Agriculture, the Agriculture Container Recycling Council, GROWMARK, Inc., the Illinois Fertilizer and Chemical Association, Tri-Rinse, Inc., United Agri-Products, UAP Richter, the Illinois Farm Bureau, and University of Illinois Extension.

To obtain a free brochure about the program, call the Illinois Department of Agriculture toll free at (800)641-3934. A full list of single-day, as well as year-round, collection sites is available online at http://www.agr.state.il.us/Environment/recycle.html. The single-day collection sites begin July 19th and end on August 13th.

*(Bruce Paulsrud; Source: Adapted from an Illinois Department of Agriculture press release, July 7, 2004.)*

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